Space Weather Forecast

Issued on Thursday, 21 December 2023 at 13:29 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

Space Weather Forecast Headline: Chance of isolated Moderate flares throughout. CME from Moderate flare on 21 December still being analysed.

Analysis of Space Weather Activity over past 24 hours
Solar Activity: Solar activity has been Moderate, with one Moderate class flare observed from the complex region in the southwest quadrant close to the western horizon. This has produced a CME (coronal mass ejection) which is currently being analysed and modelled. AR3529 in the southeast quadrant is the largest and most complex region on the disc, but has only produced Common-class flaring. A line of three moderately large and complex regions across the northern hemisphere have all shown limited evolution and some Low solar activity. These are the most significant of nine regions on the visible disc, with the remaining regions either weak or inactive.

Solar Wind / Geomagnetic Activity: Solar wind speeds have declined from slightly elevated to ambient levels as the recent fast solar wind eases. Total magnetic field strength has been weak, with the important north-south component only varying weakly. Resultant geomagnetic activity was largely Quiet to Unsettled.

Energetic Particles / Solar Radiation: High energy proton flux has been at Background levels with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary
Solar Activity: Low with a chance of becoming Moderate with isolated Moderate flares.

Solar Wind / Geomagnetic Activity: No Earth-directed CMEs are currently forecast. The current fast solar wind is continuing to wane. A further fast wind is forecast to connect with the Earth either late on 21 December or during 22 December with elevated or strong speeds forecast. These are then likely to wane during 23 December. Geomagnetic activity is expected to remain largely Quiet to Unsettled during the period. There is a chance of Active and a slight chance of a G1/Minor Storm interval upon uncertain connection to a high speed stream on 21 December and more likely on 22 December.

Energetic Particles / Solar Radiation: Solar radiation storms are considered very unlikely.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	5	10	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	50	50	50	50
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	10
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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